CLAIMS

- 1. A wavelength division multiplex optical ring network comprising optical fibre (1-4) arranged in a ring configuration and a plurality of doped fibre optical amplifiers (17-20) arranged in the ring, in which the spectral response in the ring is configured such in use amplified spontaneous emission (ASE) noise circulates around the ring in a lasing mode to clamp the gain of each doped fibre optical amplifier; characterised in that each optical amplifier includes respective control means (28) which in use control the optical amplifier to produce a substantially constant output power or to maintain a substantially constant pump power.
- 2. An optical network as claimed in claim 1, and further comprising detection means (27) arranged to switch control of the optical amplifiers (17-20) to a different mode of operation, in response to the detection of the absence of a lasing peak.
- 3. An optical network as claimed in claim 2, in which the detection means is arranged to switch the optical amplifiers to a gain control mode after loss of the lasing peak in which the gain before the loss of the lasing peak is maintained.
- 4. An optical network as claimed in claim 3, in which the optical amplifiers are arranged to switch to constant output power mode, or constant pump power mode, after a predetermined delay after the gain control mode has been established.
- 5. An optical network as claimed in any of claims 1 to 4, in which the detection means includes means (21, 22, 25) for tapping a fraction of the input or output power of

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each optical amplifier, and detectors for measuring the input and/or output powers (27,24).

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- 6. An optical network as claimed in claim 5, in which the detection means includes a filter (26) for passing only ASE noise, and a detector (27) for detecting the presence or absence of the lasing peak.
- 7. An optical network as claimed in claim 5, in which the detection means includes a filter (26) for passing only ASE noise, and a detector (27, 23) for detecting a simultaneous decrease in the powers of both the ASE noise peak and the total power input.
- 8. An optical network as claimed in claim 5, in which the detection means includes a detector for detecting a decrease in the power of the input to each optical amplifier.
- 9. An optical network as claimed in any one of claims 1 to 8, in which, in the event of slow drift of the optical amplifiers, the working point is changed in use to restore the level of the ASE peak.